



# GROUND RULES

Army building foundational software for Common Operating Environment

*by Kris Osborn and Margaret C. Roth*

## SEEKING INTEROPERABILITY

The Army will establish and enforce stringent technical standards for software infrastructure that will guide materiel development and ensure built-in interoperability. This includes researching leap-ahead capabilities to enhance the foundation of the network modernization. (U.S. Army photo by Mike Allison.)



The U.S. Army's System-of-Systems Engineering effort has identified a number of computing environments through which to implement standards defined by the Army Chief Information Officer (CIO/G-6), service officials said. When adopted into the foundational software and hardware, these standards will define the Common Operating Environment (COE).

**T**he intent of the COE is to allow different systems—such as battle command applications, sensors, and vehicles on the move—to communicate more efficiently.

The COE is an initiative aimed at addressing interoperability between systems and agility in development and deployment. It also focuses on an open architecture to leverage industry innovation, cyber-hardened foundations for security, and reducing life-cycle cost of systems.

The computing environment (CE) structure is geared toward organizing the Army environment from the sustaining base to the tactical edge, including sensors, command posts, mounted vehicles, handheld devices, mission command platforms, and numerous applications in real time on the battlefield, service officials explained.

### STRINGENT STANDARDS

The Army will establish and enforce stringent technical standards for software infrastructure that will guide materiel development and ensure built-in interoperability, said Terry Edwards, Director of System-of-Systems Engineering for the Office of the Assistant Secretary of the Army for Acquisition, Logistics, and Technology (ASAALT).

Also, the COE will be aligned to industry trends, best practices, and products while making the necessary investments in complementing security components to support DOD-unique requirements. This will enable the Army to quickly take

advantage of commercial innovation and will spur competition, Edwards said.

The COE is being designed to tell industry upfront and with certainty the parameters within which Army technology (hardware and applications) must fit. The plan is to establish an ecosystem for each of the CEs so that developers have access to architectures, foundational products, and certification environments required for developing applications.

“What we are saying is, we want to go to a model where we provide these foundation pieces and make them available. That will then let everybody who wants to build applications build them on this common foundation,” Edwards said.

### BUILDING A FOUNDATION

Edwards compared the Army effort to commercial endeavors such as those undertaken by Apple and Google.

“If you look at what Apple and Google have done, you will see that the Apple foundation and the Android foundation have a bunch of software that determines their environment,” Edwards explained. “When you go to build an app, it does not take a long time to build because a lot of the pieces are already there. All those are common pieces of software that have been provided by the Apple and Android environment. People take that software, and they build their application on top of that,” he said.

“The computing environments allow us to organize our programs in such

a way that there is greater efficiency due to greater collaboration among the PMs [program managers],” said Monica Farah-Stapleton, COE Lead for System-of-Systems Engineering.

A key rationale for the COE is to ensure that various mission command applications all work together on a common software foundation, Farah-Stapleton explained.

The CEs will have a minimum standard configuration that supports the Army's ability to produce and deploy high-quality applications rapidly. They will reduce the complexities of configuration and support training, as well as reduce life-cycle cost.

By focusing on the “control points,” strict compliance to standards will ensure interoperability between CEs, Edwards explained.

### BENEFITS TO INDUSTRY

The CE standards promise to be as valuable to industry as to the Army. “I can tell you just from the joint tactical radio environment, we've received a lot of positive feedback from industry in terms of the definition of standards,” said BG Michael E. Williamson, Joint Program Executive Officer Joint Tactical Radio Systems.

CEs will allow the Army to more frequently and more clearly articulate capability gaps and to put those requests for information out faster, explained LTG Susan S. Lawrence, Army CIO/G-6.

Industry is willing and able to respond, she said. “They tell me they will spend

their research dollars, but they're afraid that they're out building something that we don't need, and they're trying to guess. And so it is on us to do a better job in communicating with industry those capability gaps and get those requests for information out faster. And we're really going to work that hard."

Staying up to date with technology will be an ongoing responsibility that industry shares with the Army, said GEN Peter W. Chiarelli, Vice Chief of Staff of the Army. "We're going to hold that [vendor] responsible to make sure that they're staying up with technology. And if they want us to keep buying their widget, their widget ... better ensure that it incorporates the advances."

### **SUPPORTING THE NETWORK**

The scope of the COE goes well beyond procurement of tactical and operational applications, Chiarelli noted. "It's also very, very important for those things that are going to be pulling data that will allow us, across the board, to ensure that we have one network and have accessibility to all the data we need to run an organization of 1.1 million men and women."

"The network strategy is now end to end," Lawrence said. "So, as we became this 80 percent CONUS-based Army, by extending the global network to every post, camp, and station, a Soldier now can train as he fights. We can deploy with little to no notice, and to any austere environment because you're connected to the network everywhere as we work through this."

"By putting the battle command systems inside the cloud, we can extend it virtually to every post, camp, and station," she said. "So a Soldier can train in his motor pool on his battle command systems. ... In the past, they had to go to the field to train on their systems."



### **INTEGRATING THE TACTICAL NETWORK**

Soldiers evaluate technologies and the integration of multiple programs into a larger tactical network during the Brigade Combat Team Modernization Limited User Test at White Sands Missile Range, NM. (U.S. Army photo by Richard Rau.)

The Army has already proven that it can extend the Afghan mission network to the next deployers, Lawrence said. For every unit going into the theater now, "we have put the Afghan Mission Network into their headquarters. Today it's with MG Jim Huggins [Commanding General] at 82nd Airborne Division," who meets with his counterpart in Afghanistan every day. "And that's what this end-to-end global network enterprise is going to deliver for our teams."

### **THE PATH FORWARD**

Edwards and his team are working on establishing the framework and governance structure as part of the implementation plan to execute this vision of the COE. This is a huge undertaking that requires a change in how the Army thinks and develops systems, Edwards said.

When asked how this differs from what the Army did on the Future Combat Systems program, Edwards said, "While the concepts are the same, the idea here is to harness software from successful existing systems within a CE and establish that as 'foundational software' to build on successes."

When implemented, the COE will give the warfighter and the generating

force unprecedented capability, flexibility, and agility to exploit information, Edwards added.

"We can't afford to chase technology," Williamson said. "And so what those standards do for us is to give us the ability to make sure that we are both backward- and forward-compatible as we move forward. And that's a critical piece of understanding the architecture and understanding the standards."

For more information on the COE, go to <http://ciog6.army.mil>.

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